

Claims

Claims 1-30 (Cancelled)

31. (Currently Amended) An apparatus for containing multiple micro-volume liquid samples comprising a substrate, wherein the substrate defines a plurality of sample chambers, wherein each sample chamber:

(a) extends through the substrate;

~~(b) has a height to width ratio of less than or equal to 2:1 when the height of the sample chamber is measured from one face of the substrate to the other;~~

~~(be) comprises one or more walls and an opening at each end; and~~

(c) comprises a hydrophobic annular ring on the wall of the chamber, separating two hydrophilic regions; and

(d) holds a sample ~~such that the sample is~~ in the form of a thin film such that a liquid sample present in the ~~one~~ sample chamber does not intermix with a liquid sample present in another sample chamber, ~~wherein the substrate comprises titanium.~~

32. (Currently Amended) An apparatus according to claim 31, wherein the sample chamber has a height to width ratio less than or equal to 24:1, when the height of the sample chamber is measured from one face of the substrate to the other.

33. (Currently Amended) An apparatus according to claim 31 wherein the substrate comprises hydrophobic regions, ~~wherein the hydrophobic regions are~~ located on the substrate such that a liquid sample present in one sample chamber does not intermix with a liquid sample present in another sample chamber.

34. (Original) An apparatus according to claim 33, wherein the substrate comprises an upper face and a lower face.

35. (Original) An apparatus according to claim 34, wherein the through axes of the sample chambers are perpendicular to both faces of the substrate.

36. (Original) An apparatus according to claim 35, wherein the sample chamber has the shape of a right circular cylinder.

37. (Original) An apparatus according to claim 35, wherein the sample chamber has the shape of a right polygonal prism.

38. (Currently Amended) An apparatus according to claim 33, wherein the hydrophobic regions are located on the upper and lower faces of the substrate such that the openings of at least one sample chamber is separated from at least one adjacent sample chamber by a hydrophobic region.

39. (Original) An apparatus according to claim 38, wherein additional hydrophobic regions are located on the walls of the sample chambers.

40. (Currently Amended) An apparatus according to claim 33, wherein the additional hydrophobic regions are located on the walls of the sample chambers.

41. (Currently Amended) An apparatus according to claim 40, wherein the additional hydrophobic region forms an annular ring along the wall of the sample chamber.

42. (Original) An apparatus according to claim 40, comprising two or more hydrophobic regions, each forming an annular ring along the wall of the sample

chamber, wherein the hydrophobic regions define one or more annular non-hydrophobic rings therebetween.

43. (Original) An apparatus according to claim 31 further comprising at least one component of a reaction to be carried out in the apparatus.

44. (Original) An apparatus according to claim 31, wherein a reaction component is affixed to the substrate.

45. (Previously Presented) An apparatus according to claim 43, wherein the component is a reagent used in a nucleotide sequencing reaction, a hybridization reaction, or a polynucleotide amplification reaction.

46. (Original) An apparatus according to claim 31, wherein the apparatus is substantially free from contaminating amplifiable polynucleotides.

47. (Currently Amended) A kit comprising an apparatus for containing multiple micro-volume liquid samples comprising a substrate, wherein the substrate defines a plurality of sample chambers, wherein each sample chamber:

(a) extends through the substrate;

~~(b) has a height to width ratio of less than or equal to 2:1 when the height of the sample chamber is measured from one face of the substrate to the other;~~

(be) comprises one or more walls and an opening at each end; and

~~(cd) holds a sample such that the sample is in the form of a thin film such that a liquid sample present in the one sample chamber does not intermix with a liquid sample present in another sample chamber, wherein the substrate comprises titanium~~ kit further includes a reagent used in a polynucleotide amplification reaction.

48. (Currently Amended) The kit according to claim 47, wherein the sample chamber has a height to width ratio less than $\frac{24}{1}$, when the height of the sample chamber is measured from one face of the substrate to the other.

49. (Cancelled)

50. (Original) A kit according to claim 47, further comprising a hydrophobic substance to be used with the apparatus.

51. (Original) A kit according to claim 50, wherein the hydrophobic substance is a hydrophobic fluid packaged in a suitable container.

52. (Original) A kit according to claim 50, wherein the hydrophobic substance is a hydrophobic cover.

53. (Original) A kit according to claim 47, further comprising a chamber for maintaining the appropriate environmental conditions for a reaction to be carried out in the apparatus.

54. (Original) A kit according to claim 47, further comprising an apparatus for loading samples into the sample chambers.

55. (Previously Presented) An apparatus according to claim 31, wherein the substrate comprises top and bottom surfaces that each contain raised features which form closed curves circumscribing the openings to said sample chambers.

56. (Cancelled)

57. (Currently Amended) An apparatus according to claim 45, for containing multiple micro-volume liquid samples comprising a substrate, wherein the substrate defines a plurality of sample chambers, wherein each sample chamber:
extends through the substrate;
comprises one or more walls and an opening at each end; and
holds a sample in the form of a thin film such that a liquid sample present in the sample chamber does not intermix with a liquid sample present in another sample chamber; and wherein the apparatus includes template, reagent and primer pairs for a polynucleotide amplification reaction.

58. (Previously Presented) An apparatus according to claim 57, wherein the template is DNA.

59. (Currently Amended) An apparatus for containing multiple micro-volume liquid samples comprising a substrate, wherein the substrate defines a plurality of sample chambers, wherein each sample chamber:
(a) extends through the substrate;
(b) comprises one or more walls and an opening at each end; and
(c) holds a sample ~~such that the sample is~~ in the form of a thin film such that a liquid sample present in the ~~one~~ sample chamber does not intermix with a liquid sample present in another sample chamber, and further comprising a reagents ~~sufficient to carry out a nucleotide sequencing reaction, a hybridization reaction, or~~ used in a polynucleotide amplification reaction.

60. (Previously Presented) An apparatus of claim 59 wherein the substrate is titanium.

61. (Previously Presented) An apparatus of claim 59 wherein the samples chamber have a height to width ration of less than or equal to 2:1 when the

height of the sample chamber is measured from one face of the substrate to the other.

62. (Previously Presented) An apparatus of claim 61 wherein the substrate comprises titanium.

63. (Previously Presented) An apparatus according to claim 59, wherein the chambers comprise a hydrophobic annular ring on the wall of the chamber, separating two hydrophilic regions.

64. (Cancelled)

65. (Cancelled)

66. (Currently Amended) A kit according to claim ~~4764~~ comprising a hydrophobic cover.